

# Assessment of The Economic Potential of Artificial Intelligence in The Higher Education Sector: Structural Analysis and Forecasting

 Musaev Djanibek Dzhambulovich

Master's Student, University of Science and Technology, Uzbekistan

 Gaibnazarova Zumrat Talatovna

University of Science and Technologies, Vice-rector for Scientific Affairs and Innovations, Doctor of Economic Sciences, Professor, Uzbekistan

**Received:** 06 February 2026; **Accepted:** 02 March 2026; **Published:** 23 March 2026

**Abstract:** The financial instability of universities necessitates fundamental restructuring. The strategic integration of artificial intelligence (AI) can optimize costs by up to 30% and unlock new revenue streams by improving student retention and diversifying programs. The adoption of AI is becoming an economic imperative for the survival and development of the sector.

**Keywords:** Restructuring, higher education, university, artificial intelligence (AI), financial stability, cost optimization, administrative costs, operating expenses, student retention, tuition revenue, revenue diversification, digital infrastructure, business model, digital transformation.

**Introduction:** Higher education worldwide is experiencing a severe crisis due to declining public funding, demographic challenges, and rising operational costs [5].

In the current climate, maintaining the status quo will lead to a structural deficit. Traditional cost-cutting methods have become ineffective due to the effect of Baumol's "cost disease": the price of educational services is rising faster than inflation, while faculty labor productivity remains unchanged.

This article argues that the strategic implementation of artificial intelligence is the only way to overcome this economic paradox. This is not merely a technological upgrade but a fundamental economic imperative necessary to prevent a wave of institutional bankruptcies and ensure the long-term competitiveness of the sector.

## LITERATURE REVIEW

An analysis of existing literature is strategically important for understanding the multifaceted crisis in higher education and for assessing the theoretical potential of artificial intelligence as a means to overcome it. Research confirms the existence of systemic financial problems and points to artificial intelligence as a key factor for future sustainability.

- **Global Challenges: The "Demographic Cliff" and a Liquidity Crisis.** The higher education sector has entered a "perfect storm," characterized by demographic decline and rising operational costs [5].

Firstly, beginning in 2025, developed markets will face what is known as the "enrollment cliff." Forecasts predict that after a peak in 2025, the number of high school graduates will begin to decline, leading to a 15% decrease in enrollment by 2039 [15]. This poses the risk of losing a critical number of students for regional and private higher education institutions.

Secondly, the financial model of universities is showing signs of systemic failure. An analysis by the Office for Students indicates that without decisive action, up to 45 percent of UK universities could face an operational deficit in the 2025-2026 academic year [16]. The situation is exacerbated by Baumol's "cost disease": a high share of the wage fund in expenditures makes it impossible to reduce the cost of teaching without a loss of quality, unless automation tools are implemented.

- **Risks of maintaining the current model.** Abandoning structural reforms poses an existential risk. Experts predict that in the next decade, up to 370 US colleges and universities may be forced to close or undergo mandatory mergers due to a lack of funding [17]. For large public higher education institutions, the threat is not closure, but "zombification" - that is, chronic financial deficits, the degradation of the research base, and a loss of global competitiveness.

- **Theoretical Foundations for the Application of Artificial Intelligence.** Leading analytics and consulting firms (McKinsey, PwC, BCG) and international organizations (OECD) are identifying artificial intelligence as the primary tool for "bending the cost curve" in higher education [4]. The McKinsey Global Institute estimates that automation based on artificial intelligence can reduce university administrative costs by up to 30% [4]. At the same time, as the OECD notes, artificial intelligence does not diminish the value of higher education; on the contrary, it highlights the need to adapt it to the new realities of the labor market and technological capabilities. This maintains the relevance of investing in this sector [5].

- **AI Readiness and Governance in the Sector.** The successful implementation of artificial intelligence depends on preparedness at both the state and institutional levels. The Government AI Readiness Index, prepared by Oxford Insights, shows that a growing number of countries, including low and middle-income nations, are developing national artificial intelligence strategies [6]. At the university level, establishing clear governance frameworks is crucial. An example of this is Tsinghua University, which was one of the first to develop guidelines for the use of artificial intelligence in education and research [7]. Regulatory bodies also emphasize this necessity: the New South Wales Audit Office recommends that universities create centralized registries of AI products and develop comprehensive strategies for their implementation [3].

- **The Regional Context:** Uzbekistan's Experience. The Republic of Uzbekistan is a unique example of rapid digital transformation in Central Asia. In contrast to the gradual evolutionary path of Western

countries, Uzbekistan is implementing a "digital leap" model, supported at the state level through the "Digital Uzbekistan - 2030" strategy (PF-6079).

According to Oxford Insights' "Government AI Readiness Index 2024," Uzbekistan ranked 70th globally, becoming the leader in Central Asia and, for the first time, surpassing neighboring countries in government readiness to implement artificial intelligence [6].

Empirical data confirm the high readiness of academic circles for change:

**Teachers:** According to the OECD TALIS 2024 report, 62% of educators in Uzbekistan are already using elements of artificial intelligence in their professional activities, which is almost double the average for OECD countries (36%) [18].

**Students:** Surveys conducted at the republic's leading higher education institutions show that 94.3% of students use artificial intelligence tools (including ChatGPT) in their learning process, while 5.7% are already using paid professional versions of neural networks [18].

These statistics indicate that the bottom-up adoption of technology in Uzbekistan is outpacing formal institutional regulation, creating highly favorable conditions for the economic restructuring of universities proposed in this work.

The existing literature clearly confirms the presence of a financial crisis in the sector and the theoretical potential of artificial intelligence as a solution. However, there is a noted lack of comprehensive economic models that assess the overall financial effect of implementing artificial intelligence. This constitutes the primary objective of this study.

## METHODOLOGY

A comprehensive approach was utilized to quantitatively assess the economic impact of artificial intelligence on the financial condition of universities. This approach includes a meta-analysis of empirical data from industry reports, thematic studies, and financial documents for the years 2023-2025, as well as the development of an econometric model for a hypothetical public research university.

- **Data Sources.** The research is based on the following primary sources:

- o **Financial Reports:** The University of Michigan's 2024 Annual Report [8], the New South Wales Audit Office's 2024 Report [3].

- o **Industry Surveys and Studies:** PwC's 2024 Cloud and AI Business Survey [9], Forrester's Total Economic Impact study for Ellucian [10].

o **Case Studies:** Southern New Hampshire University/EdSights [11], Western Kentucky University [4].

o **Analytical Reports:** "The Impact of Artificial Intelligence on the Financial Stability of Universities (2023-2025) " [4], the World Bank's "The Artificial Intelligence Revolution in Education" [12].

• **Structure of the Economic Model.** The university's core financial model is defined as a function of revenues and expenses: Net Operating Result =

(Tuition Revenue + Research Revenue + Other Revenue) - (Staff Costs + Administrative Costs + Operational Costs). The impact of artificial intelligence is analyzed through its effect on each of these variables, using parameters derived from the sources mentioned above.

• **Key Variables and Parameters.** The key parameters used in the model to assess the impact of artificial intelligence are presented in the table below.

Model Parameter	Description	Value
$\Delta\text{AdmCost}$	Reduction in administrative costs	Up to 30%
$\Delta\text{IT\_Maint}$	Savings on IT services and infrastructure	\$2.8 million (over 3 years)
$\Delta\text{Retention}$	Increase in student retention rate	1.4% - 4.6%
$\Delta\text{Conversion}$	Increase in applicant conversion rate	Up to 25%

Source: Compiled by the author based on data from the McKinsey Global Institute [4], Forrester TEI of Ellucian [10], and the SNHU Case Study [11].

This model is applied to the analysis of a hypothetical public research university to demonstrate the overall economic effect of the strategic implementation of artificial intelligence.

**Main Part: Modeling the Economic Impact of Artificial Intelligence**

This section provides a detailed quantitative analysis of the impact of artificial intelligence on the financial performance of a hypothetical university, following the methodology developed herein. The analysis is divided into cost optimization, revenue growth, and an assessment of the overall impact on the business model.

• **Cost Optimization.** Artificial intelligence enables increased operational efficiency by significantly reducing administrative and operational costs. According to a Forrester study conducted for Ellucian, implementing a cloud-based ERP system with AI elements can save over 35,000 hours of

administrative labor and 9,400 hours of IT labor annually by automating routine processes [10]. This is further supported by McKinsey's macroeconomic assessment, which estimates that the potential for reducing administrative costs in higher education is as high as 30 percent, making it a crucial factor for optimizing the cost structure [4]. AI tools automate tasks ranging from processing applicant submissions to answering common student inquiries, thereby freeing up resources for more complex duties.

• **Numerical Analysis.** Let's consider a model of a hypothetical public research university with an annual budget of \$1 billion, where administrative expenses account for 15% (\$150 million). Implementing artificial intelligence could lead to the following savings:

**Revenue Growth and Diversification.** Artificial intelligence not only reduces costs but also creates new sources of revenue. One of the main areas of focus is increasing student retention rates. A study conducted

by Southern New Hampshire University (SNHU) showed that using an AI chatbot for active student support increased their retention rate by 1.4-4.6% [11]. In absolute terms, this generates significant revenue. Western Kentucky University earned an additional \$4.7 million in tuition revenue by retaining and recruiting students, using predictive analytics to optimize financial aid [4]. Furthermore, artificial intelligence enables revenue diversification by creating new educational products, such as micro-credentials and flexible online programs that are in increasing demand [2, 13]. AI also opens up new opportunities for increasing revenue from scientific research.

Leading universities investing in artificial intelligence

competencies are attracting significant funding. For example, the University of Michigan, which is actively developing its AI programs, reported spending \$2.04 billion on research, leading to 615 inventions and 28 startups [8]. These figures indicate that a strategic focus on advanced technologies, including artificial intelligence, directly translates into the commercialization of intellectual property and new revenue streams.

- **Numerical Analysis.** Let's assume the tuition revenue for a hypothetical university is \$600 million (based on 20,000 students and an average annual tuition of \$30,000).

Additional Revenue Source	Key Metrics	Impact of Artificial Intelligence	Additional Revenue
<b>Improving Student Retention</b>	20,000 students	2% increase in retention (400 students)	\$12,000,000
<b>New Online Programs</b>	-	Program launch (1,000 students, \$5,000 per year)	\$5,000,000
<b>Total Additional Revenue</b>	-	-	<b>\$17,000,000</b>

Source: Compiled by the author.

- **Overall Financial Performance and Business Model Restructuring.** The wide-scale implementation of artificial intelligence will have a multifaceted impact on the university's financial condition, improving operating margins and return on investment. A study by Forrester shows that the return on investment from implementing a cloud platform with modern artificial intelligence could reach 133% in less than six months [10].

What does this mean? Artificial intelligence is becoming a catalyst for a strategic shift from capital expenditures on physical infrastructure to investments in digital infrastructure. This view is confirmed by 81% of the heads of higher education institutions who participated in a PwC survey. They note that in the future, digital investments will take precedence over investments in campuses [9]. This shift fundamentally

transforms the university's economic model, changing it from one based mainly on fixed costs (buildings, permanent staff) to a flexible, variable-cost model based on scalable artificial intelligence platforms. A decrease in the fixed administrative cost base ( $\Delta\text{AdmCost}$ ) increases operating leverage. Each additional dollar gained from increasing student retention ( $\Delta\text{Retention}$ ) or conversion ( $\Delta\text{Conversion}$ ) rates yields significantly more net profit. This radically improves the institution's financial risk profile. It also allows human resources to be redirected from simple administrative tasks to high-value relationships with students - what SNHU calls the "work of the heart" [11].

- **Final financial result.** The overall effect is expressed as an increase in the operating margin from 2.0% to 8.1%, indicating a radical improvement in the institution's financial position.

Indicator	Before AI implementation	After AI implementation	Change
<b>Total Revenue</b>	\$1 billion	\$1.017 billion	+\$17 million

<b>Total expenditures</b>	\$980 million	\$935 million	-\$45 million
<b>Net operating result</b>	<b>\$20 million</b>	<b>\$82 million</b>	<b>+\$62 million</b>
<b>Operating margin</b>	2.0%	8.1%	+6.1%

Source: Prepared by the author.

The modeling indicates a significant positive impact, confirming that economic restructuring based on artificial intelligence is not only possible but also necessary for the financial revitalization of the sector.

**CONCLUSION**

The strategic implementation of artificial intelligence is not a technological fad but an economic necessity for ensuring the financial stability and competitiveness of higher education institutions. The analysis shows that artificial intelligence has the potential not only to reduce administrative costs by up to 30% but also to increase revenues by improving student retention rates by 2-4% and creating new educational products. Successfully realizing this potential requires coordinated efforts from both government bodies and university leadership. Universities that ignore this shift may face structural deficits and lose their relevance, while innovators will secure decades of growth and academic leadership.

**Recommendations for Public Authorities.** To create a favorable macroenvironment, state intervention should focus on formulating a unified national strategy that provides the infrastructural, legal, and ethical framework for innovation.

- 1. Developing National Strategies.** It is necessary to create national strategies that define priorities, standards, and funding mechanisms for implementing artificial intelligence in education. The experience of countries leading the Government AI Readiness Index shows that the existence of such a strategy is a key factor for success [6].
- 2. Investing in Digital Infrastructure.** Targeted government investment is required to bridge the digital divide and ensure equitable access to artificial intelligence tools. International partnerships, such as the "Connected Schools for All" initiative by the World Bank and the Inter-American Development Bank, serve as good examples [14].
- 3. Establishing a Regulatory and Legal Framework.** Developing ethical norms and standards

for the use of artificial intelligence in education should be a priority. The experience of UNESCO [12] and the guidelines proposed by Tsinghua University [7] can serve as a basis for creating a national regulatory framework that ensures the responsible and safe application of these technologies.

**Recommendations for University Leadership.** At the institutional level, success will depend on the transition from individual tactical steps to holistic strategic transformations centered on data, collaboration, and human capital.

- 1. Transitioning from isolated solutions to a comprehensive strategy.** Instead of haphazardly implementing various artificial intelligence tools, universities should develop a holistic institutional strategy. As recommended in the NSW Audit Office report [3], this process includes compiling a centralized registry of applied AI products and evaluating their effectiveness.
- 2. Prioritizing data modernization.** Successful implementation of artificial intelligence requires accessible, high-quality, and integrated data. Data modernization is an economic necessity, not just a technical one, as high-quality data is the primary asset for an AI-based revenue and cost optimization model [9].
- 3. Developing public-private partnerships.** Collaboration with technology companies and educational technology startups can significantly accelerate innovation. As highlighted in reports by HolonIQ [13] and the World Bank [12], joint efforts enable the faster scaling of successful solutions and the shared use of resources.
- 4. Investing in human capital.** Artificial intelligence technologies are not meant to replace humans, but rather to complement them. Therefore, retraining and upskilling teachers and administrative staff for effective collaboration with artificial intelligence systems is becoming a primary task. This will allow them to focus more on tasks that require empathy, critical thinking, and creativity.

REFERENCES

1. Jacobs G., Munoz J. AI and Education: Strategic Imperatives for Corporations and Academic Institutions // California Management Review Insights. 2025. URL: <https://cmr.berkeley.edu/2025/05/ai-education-strategic-imperatives/>
2. Watermark. How Higher Education Institutions Can Unlock New Revenue Streams with Better Data. 2025. URL: <https://www.watermarkinsights.com/resources/how-higher-education-institutions-can-unlock-new-revenue-streams-with-better-data>
3. Audit Office of New South Wales. Universities 2024. URL: <https://www.audit.nsw.gov.au/our-work/reports/universities-2024>
4. Global Education Analysis Group. Impact of AI Technologies on University Financial Health (2023-2025).
5. OECD. Financial Sustainability of Higher Education. 2025. URL: [https://www.oecd.org/en/publications/the-financial-sustainability-of-higher-education\\_f544ccfe-en.html](https://www.oecd.org/en/publications/the-financial-sustainability-of-higher-education_f544ccfe-en.html)
6. Oxford Insights. Government AI Readiness Index 2024. URL: <https://www.oxfordinsights.com/government-ai-readiness-index-2024>
7. Tsinghua University. Tsinghua University Releases the First University-Wide Framework Governing AI in Teaching and Research. 2025. URL: <https://www.prnewswire.com/news-releases/tsinghua-university-releases-the-first-university-wide-framework-governing-ai-in-teaching-and-research-302170662.html>
8. University of Michigan. Ann Arbor: The Regents of the University of Michigan, 2025. URL: <https://2024.annualreport.umich.edu/>
9. PwC. Cloud and AI Business Survey: Building the AI-Powered Business. 2024. URL: <https://www.pwc.com/us/en/tech-effect/cloud/cloud-ai-business-survey.html>
10. Ellucian. Ellucian Colleague SaaS Delivered 133% ROI for Higher Education Institutions According to Total Economic Impact Study. 2025. URL: <https://www.ellucian.com/newsroom/ellucian-colleague-saas-delivered-133-roi-higher-education-institutions-according-total>
11. EdSights. Southern New Hampshire University's Use of Artificial Intelligence to Improve Student Outcomes. 2024. URL: <https://docsend.com/view/cnsc5m3kudkssbqf>
12. World Bank. AI Revolution in Education: What You Need to Know. 2024. URL: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099734306182493324>
13. HolonIQ. 2025 Education Trends Snapshot: AI, Skills, and Workforce Pathways. 2025. URL: <https://www.holoniq.com/notes/2025-education-trends-snapshot-ai-skills-and-workforce-pathways>
14. World Bank. Digital Education (Education in Latin America and the Caribbean - Digital Transformation Program). 2024. URL: <https://www.worldbank.org/en/programs/education-america-latina-caribe/digital-transformation>
15. Conley, B., & Massa, B. Reframing the Enrollment Cliff: A New Lens on Enrollment Management. Changing Higher Ed. 2025. URL: <https://changinghighered.com/reframing-the-enrollment-cliff-a-new-lens-on-enrollment-management/>
16. Office for Students (OfS). Financial sustainability of higher education providers in England: 2025 update. 2025. URL: <https://www.officeforstudents.org.uk/publication/s/financial-sustainability-of-higher-education-providers-in-england-november-2025-update/>
17. Huron Consulting Group Report (2025). Cited in: Hundreds of US colleges poised to close in next decade. 2025. URL: <https://philanthropynewsdigest.org/news/other-sources/article/?id=16428763&title=Hundreds-of-US-colleges-poised-to-close-in-next-decade,-expert-says>
18. OECD. TALIS 2024 Results: Teachers and School Leaders as Valued Professionals. URL: [https://www.oecd.org/en/publications/results-from-talis-2024-country-notes\\_e127f9e2-en/uzbekistan\\_96cdef5e-en.html](https://www.oecd.org/en/publications/results-from-talis-2024-country-notes_e127f9e2-en/uzbekistan_96cdef5e-en.html)